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ABSTRACTS

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CLINICAL STUDIES, TUBERCULOSIS

Rubeola and Tuberculosis.—An epidemic of rubeola in the children's pavilion of a tuberculosis institution afforded an opportunity to investigate the effects of the disease on childhood tuberculosis. Rubeola has been repeatedly said to favor the spread or activation of tuberculosis. In the group of approximately 80 tuberculous children, 13 cases of rubeola developed. The children were observed for seven months. All of the patients did well, no gastric cultures became positive, and the children gained weight. There was no spread of the tuberculous process in any of the 13 cases, and there was a definite regression of the lesion in 4 patients.—*Effects of rubeola on tuberculosis, A. V. Mascia, F. E. Chick, & W. E. Levy, J. Pediat., September, 1953, 43: 294.*—(*M. J. Small*)

Prognosis of Small Tuberculous Lesions.—To evaluate the prognosis of "minimal" tuberculosis discovered on routine roentgenograms, 1,503 of such cases were followed for three years. Lesions considered as "minimal" lesions were less than 2 cm. and of moderate density. Dense shadows, such as tuberculomas and other round foci, are not included. Roentgenographically, three types of "minimal" tuberculosis were considered: (*1*) infiltrative lesions (60.4 per cent), appearing as single more or less homogeneous shadows; (*2*) groups of very localized nodules (24.4 per cent); and (*3*) isolated nodules (15.2 per cent). The survey covered the following groups: (*1*) students of the University of Paris, 1942 and 1943 and 1948 and 1949 (713 cases); (*2*) members of the hospital personnel of the Paris municipal hospitals surveyed between 1945 and 1949 (575 cases); (*3*) personnel of Paris insurance companies surveyed in 1948 and 1949 (215 cases). Only cases detected by the survey were included, excluding those patients with even mild symptoms. The minimal lesions so found were apical in 32.3 per cent, subclavicular in 63 per cent, and in the lower lung field in 4.7 per cent of the cases. Of the 1,503 persons with survey-detected minimal lesions, 17.6 per cent showed subsequent progression: 18.3 per cent among the general student population, 20 per cent among medical students, 17.2 per cent among hospital personnel, and 16.2 per cent among the employees of insurance companies. Correlation of progression and type of lesion revealed that infiltrates progressed in 22.5 per cent, groups of nodules in 12.2 per cent, and isolated nodules in 4 per cent. Of the left-sided lesions 20.4 per cent progressed, compared with 15 per cent of the right-sided lesions. Lesions in the subclavicular region showed a greater tendency to progress than those in the apex or in the inferior half of the lung. The age in the total survey population averaged thirty-eight years. Among the patients who developed progression of disease there were equal numbers of men and women; their average age was thirty-one years. The sedimentation rate was determined in 456 cases; it was normal in 328 patients, of whom 12.8 per cent subsequently progressed. The sedimentation rate was accelerated in 128 patients, with an incidence of progression of 53.1 per cent. Of the 265 patients who progressed, only 30 had positive gastric lavage at the time of the survey film. Of the progressions 51 per cent took place within the first year after the survey film; 22.6 per cent in the second year; 16.6 per cent in the third year;

and 9.8 per cent later.—*Éléments du pronostic des lésions tuberculeuses minimes du poumon, E. Bernard, E. Hautefeuille, & D. Bernard, Rev. de la tuberc., 1953, 17: 651.*—*(V. Leites)*

Management of Minimal Tuberculosis.—The findings in approximately 4,000 roentgenograms of the chest suggest that "discrete" is more descriptive of the lesions than "minimal." Among 641 so-called minimal lesions, 64 cavitary cases were found roentgenographically, 76.5 per cent of these being bacteriologically negative. This discrepancy between roentgenographic and bacteriologic data may indicate that bacilli are discharged intermittently, are scant in the lesions, or are devitalized or made unculturable by the newer bacteriostatic agents. Before the advent of antibiotics and the more recent chemotherapy, practically all cavitary cases were bacteriologically positive. Clinical examination detects only 4 per cent of the early cases; photoroentgenography reveals 80 per cent. Of all anatomico-roentgenologic types confirmed by tomography, exudative lesions were most likely to be progressive but also derived most benefit from modern therapy. With the increasing use of streptomycin with *p*-aminosalicylic acid or isoniazid, moderately and even far advanced lesions are becoming more and more discrete, leaving residual necrotic foci. These lesions do not heal with the usual collapse therapy, and segmental, subsegmental, or cuneiform resection seems indicated for them. It is important to detect these cases as early as possible, and Abreu's tele-roentgenography, or simultaneous localized tomography, will help considerably in this.—*Tratamento e prognóstico das lesões tuberculosas mínimas do pulmão, R. Fernandes & G. Ribeiro, Clín. tisiol., September–October, 1953, 8: 595.*—*(A. A. Moll)*

Superinfection in Sanatoriums.—Roentgenographic spreads in patients with pulmonary tuberculosis during sanatorium residence could be due to exogenous superinfection when the patients have no endogenous tendency to have progressive disease. Endogenous worsening is suggested by a history of more than one episode of active pulmonary tuberculosis prior to entering the sanatorium, the presence of an open cavity or empyema with bronchopleural fistula on admission, and sputum positive for tubercle bacilli. A series of cases of spread during sanatorium residence was divided into two groups, depending on whether the spread was in healthy parenchyma or at the site of a previous lesion. It is unlikely that the latter are exogenous; the former could be. The number of treated patients was 3,623, among whom 235 spreads were observed. Among the spreads, 42 (21.7 per cent) were situated in the healthy parenchyma and 193 (78.25 per cent) were at the site of a previous lesion. Only 3 of the 42 spreads (1.3 per cent of all spreads) occurred when there were no factors to suggest an endogenous origin. Generally, the patients who grow worse in the sanatorium have more serious involvement than other patients on admission. Personnel, such as nurses and doctors, in close contact with patients show clearly the pathologic effect of exogenous superinfection in contrast to the patients who do not. This difference may be explained by the patients' rest regimen and antituberculous treatment, which counteract the multiplication of bacilli of any origin. The patients probably annihilate exogenous superinfections and their endogenous bacillary disseminations by the same mechanisms. Experimental data prove that the body responds in the same way to bacilli from within and without. At present, no biologic or clinical data suggest that it is undesirable for any patient with pulmonary tuberculosis to be treated in a sanatorium (Authors' summary).—*Y-a-t-il danger de contagion entre malades de sanatorium, R. Cohen, D. Douady, G. Canetti, I. N. Vivien, & I. Lacalmontie, Rev. de la tuberc., 1953, 17: 489.*—*(V. Leites)*

Prognosis of Tuberculomas.—The solitary dense pulmonary focus is now frequently treated by pulmonary resection because (*1*) the lesion may be malignant and amenable to

surgical extirpation, and (2) the results with nonsurgical treatment of a so-called tuberculoma are reputed to be unfavorable. The early results of resection of tuberculomas, even without covering chemotherapy, have been favorable but the late results can be evaluated only after more time has passed. The available late results with these lesions treated by bed rest alone, bed rest plus phreniclasia, pneumothorax, or pneumoperitoneum provide a background for assessing the results of surgical extirpation or prolonged chemotherapy. The clinical records of all patients admitted to Trudeau Sanatorium during 1930 to 1949, inclusive, revealed only 40 patients whose disease consisted principally of one or more solitary dense pulmonary foci; 33 had single lesions, 6 had two foci, and one had three. All were "minimal" lesions at the time of discharge, but a cavity had previously been observed within the dense focus in 29 of the 40. Seven had been treated with pneumothorax, 4 with phrenic nerve interruption, and one with pneumoperitoneum. One had received 12 gm. of *p*-aminosalicylic acid daily for three months and another 1 gm. of streptomycin intramuscularly daily for sixty days. No other patients had received specific chemotherapy. These 40 patients were given one to twenty-five consecutive months (mean, seven months) of modified bed rest. They spent two to thirty-two months (mean, ten months) on sanatorium treatment. One 3 cm. nodule below the level of the right hemidiaphragm was proved to be a benign fibroleiomyoma following resection. No tumors, malignant or benign, have been proved in the other 39 cases. The cumulative rate of progression in the 39 cases was 26.1 per cent projected over twenty-two years by the life-table method. Not only is this cumulative relapse rate somewhat lower, but the curve rises more slowly than that in active minimal tuberculosis. Two of the 9 patients with progression became quite ill and were disabled for many years before attaining relatively good health; 6 had one progression followed after treatment by uninterrupted good health, and one had two separate progressions. Of the 38 patients at the time of the study, 34 were working and well; 2 were dead from nontuberculous causes; and in 3, contact was lost but they were still well eight, seventeen, and eighteen years after discharge. Thus, there is about one chance in four that the disease will progress when pulmonary tuberculosis is characterized by one or more solitary, dense circumscribed foci (tuberculomas) and has been treated without chemotherapy, resection, or permanent collapse. Severe or fatal progressions of such lesions have been rare.—*Late results in the tuberculomas, R. S. Mitchell, Ann. Int. Med., September, 1953, 39: 471.*—(*T. H. Noehren*)

Resection of Pulmonary Foci.—The results of pulmonary resection of localized necrotic tuberculous lesions from 221 patients followed one to five years postoperatively were reviewed, considering only lesions involving one lobe and no more extensive than minimal lesions as defined by National Tuberculosis Association standards. Of the lesions, 69 were cavitary, 2 were diffusely caseopneumonic, 96 were caseonodose, and 54 were tuberculomatous. There were 68 wedge resections, 38 segmental resections, and 115 lobectomies. Evaluation of 98.1 per cent of these patients after one to five years showed gratifying results from the excision of necrotic lesions. The operative mortality was 0.5 per cent. The incidence of postoperative tuberculous complications was 3.2 per cent; of late pulmonary reactivation, 2.2 per cent; and of late extrapulmonary (glandular) disease, 0.9 per cent. Of the patients, 93 per cent were well; 75 per cent of those operated upon prior to 1952 are working. This retrospective study dates back to 1947, and much progress has since been made in the treatment of pulmonary tuberculosis.—*Resection of tuberculous disease, J. H. Forsee, C. W. Tempel, & E. L. Scott, Ann. Int. Med., September, 1953, 39: 468.*—(*T. H. Noehren*)

Pulmonary Resection for Tuberculosis.—Among 103 pulmonary resections for the

treatment of tuberculosis, 53 were pneumonectomies, 49 lobectomies, and one segmental resection. The disease had been present nine months to five and one-half years. In 76 cases operated upon since December, 1948, streptomycin was used routinely both before and after operation, with improved results. In this group, the main postoperative complications were spreads of disease, more common after lobectomy, in 7.8 per cent of cases; reactivation of old arrested foci, more common after pneumonectomy, in 18.4 per cent; bronchial fistula and empyema, more common after lobectomy, in 13.1 per cent; and empyema without fistula, more common after pneumonectomy, in 6.5 per cent. Deaths directly connected with the operation totaled 9.2 per cent, the rate being higher after lobectomy. Deaths not directly connected with the operation represented 10.5 per cent. In the series, 72.3 per cent of the patients are clinically cured, with negative sputum, and 10.5 per cent still have lesions and a positive sputum. The group with most cures and least postoperative complications had the following surgical indications: cavities developing during therapeutic pneumothorax, residual lesions after thoracoplasty, cavities in the lower lobes, fibrotic lesions with bronchiectasia and no cavities, and filled, blocked cavities.—*Pneumonectomias e lobectomias no tratamento da tuberculose, revisão de 103 casos seguidos de 9 meses a 5 anos e meio, E. de J. Zerbini, Clín. tisiol., July–August, 1953, 8: 493.—(A. A. Moll)*

Mediastinal Lymph Node Resection.—In 3 cases lymph node resection with or without bronchotomy was performed for tuberculous adenopathy in primary tuberculosis with erosion into the bronchus. The intervention is designed to prevent the establishment of irreversible bronchopulmonary lesions. The indications for resection are based less on clinical and bronchoscopic than on roentgenographic and bronchographic findings, namely, on the tendency toward retraction of the pulmonary opacity and cylindrical bronchiectasis (Authors' summary).—*L'ezérèse ganglionnaire et la désobstruction bronchique dans certaines formes compliquées de la primo-infection, P. Giraud, H. Métras, avec la collaboration de M. Grégoire, H. Giraud, H. Longefait, L. Hartung, & A. M. Sanguinetti, Rev. de la tuberc., 1953, 17: 437.—(V. Leites)*

Surgical Drainage of Tuberculous Cavities.—In a series of 53 patients with pulmonary tuberculosis, many were subjected to surgical drainage as a last resort for bilateral lesions which were not arrested by previous treatment. In 6 cases, two cavities each were drained. Closure followed in 10 patients; 8 patients died, and 35 remain under treatment. Deaths occurred four months to one year after drainage. In all, spread of the disease rather than the drainage itself seemed to be responsible for the fatal outcome. Among the 35 patients remaining under treatment, 30 are definitely improved and, in 5, other preexistent lesions have progressed unfavorably. Maurer's method seems to be the safest and most efficient It may be used in ambulatory patients and as the only treatment in selected cases. Filled cavities surrounded by an intact parenchyma offer the best indications for surgical drainage.—*Drenagem cirúrgica no tratamento da caverna tuberculosa do pulmão, N. Brandão Lôbânio, Clín. tisiol., July–August, 1953, 8: 525.—(A. A. Moll)*

Hemorrhage in Cavity Drainage.—Small hemorrhages can occur frequently during Monaldi intracavitary drainage but the treatment seldom has to be suspended because of such a complication. A correct technique easily prevents or cures such accidents. If a severe hemorrhage occurs as the drain is introduced through the lung, the tube should be removed immediately and the patients treated with coagulants. After the drain is successfully placed, hemorrhage through the tube can arise from three main causes: (*1*) progression of the disease being treated, chiefly with unstabilized multiple cavities; if antibiotics are not successful, drainage should be interrupted; (*2*) traumatic lesions of the

cavitary wall caused by the drainage tube and sometimes favored by inspiratory movements or coughing; shortening the drain or correcting its position in the cavity is successful in most cases and drainage can be continued; (*3*) too violent or too frequent suction through the drain, which occurs mainly when the adjacent lung tissue is not elastic enough to allow re-expansion of the lung or when the draining bronchus of the cavity is obliterated; decreasing the intensity and duration of suction will prevent repetition of the hemorrhage. In some cases, however, thoracoplasty will be necessary to obtain complete collapse of the cavity. Among more than 1,000 patients treated by the Monaldi technique, no fatalities occurred and treatment had to be suspended in only a few instances.—*Fenomeni emorragici nel corso dell' aspirazione endocavitaria, F. De Marco, Arch. tisiol., April, 1953, 8: 278.*—(*A. Mochi*)

Surgical Collapse Therapy.—Of 195 cases of surgical collapse, 141 were thoracoplasties, 16 were extrapleural pneumothoraces, and 38 were cavity drainages. In the thoracoplasty group, cavities were closed in 91.2 per cent, with sputum conversion in 87.2 per cent. In the extrapleural pneumothorax series, cavities were closed and the sputum converted in 75 per cent. Drainage was usually a preliminary step for thoracoplasty. Among 4 cases in which this was the only procedure, the cavity closed in only one.—*Contribuição ao estudo do comportamento das cavernas tuberculosas na colapsoterapia cirúrgica, R. de Queiroz & M. Caetano filho, Clín. tisiol., July–August, 1953, 8: 557.*—(*A. A. Moll*)

Pneumothorax.—Among 275 patients with pulmonary tuberculosis studied in several Ontario sanatoriums in the years 1945 to 1948, 292 pneumothoraces were induced or attempted. Disease was minimal in 21 per cent, moderately advanced in 51 per cent, and far advanced in 28 per cent. Chemotherapy was used at some time in 25 per cent. Additional methods of collapse therapy were used in 54 per cent. No case was followed less than three years; 84 per cent were followed five years or more. The mortality for the minimal cases was 2 per cent at the end of five years, compared to a 20 per cent mortality among 460 patients at the end of five years treated by bed rest alone. The mortality among the moderately advanced and the far advanced group was 8 per cent and 25 per cent, respectively. The over-all mortality was 11 per cent. The incidence of empyema was 6.2 per cent; the mortality from empyema was 2.3 per cent among all of the induced pneumothoraces. Comparing these results with the results obtained from pneumoperitoneum, it is believed that pneumothorax is still to be preferred to pneumoperitoneum for the majority of cases to which collapse therapy is applied.—*Pneumothorax—Pneumoperitoneum?, T. G. Heaton, Canad. M.A.J., August, 1953, 69: 151.*—(*E. A. Riley*).

Swimming Pool Infections.—There are two types of acid-fast swimming pool infections. One is inoculation lupus, and the other is the ulcerative lesion on the elbow, presumably caused by *Myco. marinum*. Silica granuloma must be ruled out in post-abrasion skin granuloma generally. A clinical diagnosis of tuberculosis verrucosa cutis was made in 9 cases. The same pool was used by all but one of the patients. Attempts to demonstrate tubercle bacilli, deep fungi, or silica were unsuccessful. Smegma bacillus was suggested as an etiologic factor but it has not been proved or disproved as yet. Tubercle bacilli were not recovered from the swimming pool. Of the 9 cases, 6 had tuberculosis verrucosa cutis on the left knee following abrasions sustained in swimming pools. Most lesions responded within three to six months to either conservative roentgen therapy, calciferol, or, in 2 resistant cases, to isoniazid, which promptly cleared the lesions. Resurfacing the swimming pools with smooth tile appears to be the best suggestion to eliminate this type of lesion.—*Granuloma following swimming pool abrasion, R. B. Rees & J. H. Bennett, J.A.M.A., August 22, 1953, 152: 1606.*—(*H. Abeles*)

CLINICAL STUDIES, NONTUBERCULOUS DISEASES

Sarcoidosis in Armed Forces.—During eighteen months, histologically proved sarcoidosis occurred in 17 members of the Armed Forces in the European Command. The patients' ages were nineteen to thirty-seven, with an average of twenty-six years; 9 were white and 8 were Negro patients. There was no oveitis, parotitis, skin involvement with typical sarcoid lesions, or bone involvement. The liver and spleen were palpably enlarged in only one case. Symptoms and clinical signs were extremely variable; 4 patients experienced aching chest pain, and 2 had swollen nodes. Of 15 cases biopsied, the liver yielded positive findings in 11, emphasizing the frequent early involvement of this organ. Investigation of the liver is important in any attempt to establish a diagnosis in suspected cases. Liver involvement cannot be determined clinically by the history and physical examination, since there may be no symptoms referable to the organ and no enlargement or tenderness, although biopsy shows marked involvement. The lymphoid tissue may be normal although the liver is already affected. Liver needle biopsy probably yields dependable evidence of sarcoidosis and is relatively harmless. Liver function tests do not parallel the biopsy results, although persistently abnormal laboratory findings, especially bromsulfalein retention, should be followed by repeated biopsies.—*Sarcoidosis in the Armed Forces, R. S. Nelson, Am. J. M. Sc., August, 1953, 226: 131.*—(*W. J. Steininger*)

Pulmonary Moniliasis.—A 34-year-old white man became suddenly ill with dyspnea, cough, blood-tinged sputum, and a temperature of 39°C. The chest roentgenogram revealed widespread acute changes in both lungs with cavity formation. Because of a suspected bacterial pneumonia, he received penicillin, streptomycin, and Aureomycin without apparent benefit. In addition to streptococci and staphylococci, several sputum cultures revealed *Candida albicans*. One urine culture was also positive for *Monilia*. In the belief that the *Monilia* played an important role in the etiology of the disease, the antibiotics were discontinued and potassium iodide was prescribed for a period of nine days. The chest roentgenogram showed improvement, with cavity closure. Further clinical improvement was noted with the substitution of *p*-aminobenzoic acid. Intensive penicillin therapy was resumed, and the patient discharged as cured. He remains well after a seven-month follow-up period.—*Über einen Fall von Moniliasis der Lungen, J. Smulewicz, Schweiz. med. Wchnschr., July 25, 1953, No. 30: 702.*— (*E. Dunner*)

Pulmonary Moniliasis.—Since the treatments for pulmonary tuberculosis and moniliasis are different, patients with progressive pulmonary disease should not be treated for tuberculosis merely because the chest film is consistent with that disease. If the sputum is negative for acid-fast bacilli, sputum or bronchoscopic specimens should be cultured repeatedly for fungi. The diagnosis of pulmonary moniliasis may be made if (*1*) *Candida albicans* is isolated consistently and in large quantities from fresh sputum or from specimens obtained by bronchoscopic aspiration, (*2*) the sputum is consistently negative for tubercle bacilli, and (*3*) no other etiologic agent can be found. There is no characteristic symptom-complex in moniliasis nor is the chest roentgenogram diagnostic. If moniliasis is diagnosed, the patient should be skin-tested to determine whether he is hypersensitive to *Candida albicans*; if so, he should be desensitized. If he is not hypersensitive or if he has been desensitized, he should be treated with iodides in large doses. Sometimes gentian violet intravenously is helpful. In most instances treatment will be successful. Four cases of pulmonary moniliasis occurred among 2,500 consecutive admissions to a tuberculosis sanatorium.—*Pulmonary moniliasis, A. C. Cohen, Am. J. M. Sc., July, 1953, 226: 16.*—(*W. J. Steininger*)

Surgery for Focalized Pulmonary Histoplasmosis.—Since February, 1951, the diagnosis of focalized pulmonary histoplasmosis has been made in 30 cases following surgical exploration and histopathologic examination. Except for one case, the diagnosis was based solely on the morphologic characteristics of *Histoplasma capsulatum* in the excised tissue. The lesions were often indistinguishable from neoplasm, tuberculoma, coccidioidoma, and other granulomatous lesions in the roentgenographic or gross appearance as well as clinical manifestations. With the identification of the organisms in the excised tissue, there has been a steady decline in the number of lesions previously classified as tuberculoma but devoid of tubercle bacillus. The inability to culture the organisms from the focalized lesions was probably due to their not being viable. There has been no evidence that dissemination of the disease results from surgical removal of the focalized lesion.—*Surgical considerations in focalized pulmonary histoplasmosis, J. H. Forsee, T. F. Puckett, & F. E. Hagman, J. Thoracic Surg., August, 1953, 26: 131.—(R. E. MacQuigg)*

Chronic Pulmonary Histoplasmosis.—Comparison of case reports of 7 cases selected from the literature and 4 new cases of chronic active pulmonary histoplasmosis discloses that the clinical manifestations tend to be uniform. The infection is found among country dwellers in the Mississippi Valley who have symptoms of chronic cough, malaise, loss of weight, and fever for a few months to several years. Roentgenographic examinations show lesions, usually in the upper lobes of the lungs, similar to those of chronic pulmonary tuberculosis, usually fibrocavitary in appearance. Specific examinations for evidence of tuberculosis usually yield negative results. Mycologic examination of sputum or biopsy material shows the presence of *Histoplasma capsulatum*. Diagnosis depends primarily upon demonstration of *Histoplasma capsulatum* in resected pulmonary tissue or repeatedly in the sputum. The course is benign and is not altered by medical therapy. Surgical excision of involved pulmonary tissue had early favorable results in 2 of 3 cases, but further observation is necessary (Authors' summary).—*Active chronic pulmonary histoplasmosis, W. D. Sutliff, F. Hughes, E. Ulrich, & L. L. Burkett, A. M. A. Arch. Int. Med., October, 1953, 92: 571.—(G. C. Leiner)*

Tularemia.—Among 32 American Indian patients with positive agglutination tests for *P. tularensis*, the frequency of respiratory symptoms including bloody sputum was striking and often resembled the symptoms of pulmonary tuberculosis. Chest roentgenograms were abnormal in 14 cases. The most common change was the occurrence of linear or fan-shaped densities extending out from the lung roots, most frequently involving the bases. These shadows were often diffuse and hazy, but sometimes dense and patchy, resembling the lesions of atypical pneumonia.—*Tularemia in northwestern Ontario, J. Millar, Canad. M. A. J., August, 1953, 69: 102.—(E. A. Riley)*

Psittacosis.—Of 10 patients with clinical or serologic evidence of psittacosis, 7 had had contact with a parakeet. One of them died of pneumonia after a week's illness. There has been great variation in the clinical appearance and toxicity of the disease in different people. In older adults it may be a serious pneumonic infection. Enlargement of the spleen occurs in experimental psittacosis in animals and birds, as well as at necropsy in human patients and clinically, especially during a few days in the latter part of atypical pneumonias. This may be the most distinctive physical sign and lead to virus complement fixation tests to confirm the diagnosis of psittacosis.—*Psittacosis, W. W. G. Maclachlan, G. E. Crum, R. F. Kleinschmidt, & P. F. Wehrle, Am. J. M. Sc., August, 1953, 226: 157.—(W. J. Steininger)*

Interstitial Pneumonia in Poliomyelitis.—Interstitial pneumonia was found in 25.6

per cent of fatal cases of poliomyelitis. It occurred either as the only pneumonic process in the lungs or in combination with some other form of pneumonia. Acute focal myocarditis was observed in 32.9 per cent of 73 cases of poliomyelitis in which multiple sections of myocardium were available. Further experimental work will be required to establish the viral etiology of interstitial pneumonia in poliomyelitis. Such pneumonia may be due to the aspiration of regurgitated gastric contents (Authors' summary).—*Interstitial pneumonia and focal myocarditis in poliomyelitis, S. S. Jurow & V. B. Dolgopol, Am. J. M. Sc., October, 1953, 226: 393.*—(*W. J. Steininger*)

Segmental Pneumonia in Infancy.—The segmental distribution of pneumonia can best be demonstrated by roentgenography, using the appropriate oblique projections. Of 127 infants with segmental pneumonia, the process was localized in the dorsal segment of the right upper lobe in 42 cases, in the apical segment of the left lower lobe in 13, in the lateral segment of the right middle lobe in 12, in the medial segment of the right middle lobe in 7, and in the apical segment of the right lower lobe in 9 cases. In the remaining cases, the localization was more or less evenly distributed in the other segments. The segmental localization of the process is thought to be caused by the endobronchial and peribronchial spread of the infection, and the greatest incidence of the localization in the dorsal segment of the right upper lobe is explained by the anatomic conditions and by the aspiration of the secretion by gravity. Some of these pneumonias in infancy may be due to the aspiration of infectious material from the upper respiratory tract.—*Uber Säuglingspneumonieformen im Röntgenbild, P. Keller, Fortschr. a. d. Geb. d. Röntgenstrahl., December, 1952, 77: 684.*—(*L. Molnar*)

Pulmonary Manifestations of Leptospirosis.—Leptospirosis is sufficiently frequent in the United States to be considered in the differential diagnosis of any acute febrile illness with one or more of the following: jaundice, nephritis, aseptic meningitis, or hemorrhagic pneumonitis. The pulmonary changes in leptospirosis are usually only incidental findings, representing part of the widespread involvement by this disease. Occasionally, however, hemorrhagic pneumonitis may be an early or striking clinical manifestation of this disease. The roentgenographic changes may consist of: (*1*) the small, patchy, localized infiltrations of "bronchopneumonia" or the more linear or segmental infiltrations of "atypical pneumonia"; (*2*) confluent, large, or even massive areas of consolidation which look like pneumonia, pulmonary edema, or parenchymal hemorrhage; or (*3*) widely disseminated small infiltrations. Among 33 patients with leptospirosis, 2 had localized or segmental bronchopneumonia; 2 had widely disseminated small pulmonary infiltrations; and one, a massive area of consolidation. The post-mortem examination of 2 patients demonstrated that the radiographic findings, which were interpreted as "pneumonia," were due to pulmonary hemorrhage and edema.—*Pulmonary manifestations of leptospirosis, C. M. Silverstein, Radiology, September, 1953, 61: 327.*—(*W. J. Steininger*)

Disseminated Lupus Erythematosus.—Pulmonary involvement is so common in disseminated lupus erythematosus that it cannot be considered coincidental. By far the most common pulmonary manifestation is pneumonia, either lobar or patchy, presumably bacterial, and in most instances responding to antibiotic therapy. A striking feature is the recurrent and migratory character of the infections. The specific pulmonary lesions of disseminated perivascular changes or chronic interstitial pneumonia and massive pleural effusion are relatively infrequent. A series of 22 patients fell into three groups: (*1*) those with recurrent pneumonias, (*2*) those with lesions which simulated tuberculosis, and (*3*) those whose symptoms were predominantly respiratory. A search for the L. E. phenomenon should be made in patients with recurring pneumonias, infiltrations, or

pleurisies of uncertain etiology.—*The pulmonary manifestations of disseminated lupus erythematosus, H. L. Israel, Am. J. M. Sc., October, 1953, 226: 387.*—(*W. J. Steininger*)

Interstitial Fibrosis of Lungs.—Earlier reports and 3 new cases of diffuse pulmonary interstitial fibrosis indicate that this is a diffuse bilateral disease of adults. Dyspnea, cyanosis, and cough were found in all cases. The duration of symptoms is long, and the disease develops progressively. Cor pulmonale and polycythemia may occur. Pathologically, this condition is characterized by diffuse alveolar wall hypertrophy on the basis of marked capillary proliferation. This angiosis plus reticulum hyperplasia is limited to the alveolar walls and accounts for their thickness. The addition of collagen in such hypertrophic walls is variable; it may be absent and is usually focal rather than wide spread.—*Diffuse interstitial fibrosis of lungs: A form of diffuse interstitial angiosis and reticulosis of the lungs, A. Golden & Th. T. Bronk, A. M. A. Arch. Int. Med., November, 1953, 92: 606.*—(*G. C. Leiner*)

Sulfuric Acid Inhalation.—A forty-year-old white man, previously healthy, was accidentally exposed to fuming sulfuric acid and for eight minutes to sulfuric acid mist and fumes. He was severely burned about the face and body. Respiratory difficulty developed immediately, requiring ten days of oxygen therapy and six weeks of hospitalization. Eighteen months later the patient had disabling pulmonary fibrosis, residual bronchiectasis, and pulmonary emphysema. In view of the experimental work on animals, this case suggests the following sequence of events. The immediate effect of the fumes was edema of the larynx, tracheobronchial tree, and probably of the lungs. Partial atelectasis of the left lower lobe occurred early. Large amounts of white, frothy, and hemorrhagic sputum were present early in the disease, denoting necrosis and mucinous degeneration of the bronchial epithelium. Secondary infection occurred, and multilobar bronchiectasis developed, most marked in the left lower lobe. As a result there was interstitial fibrosis and pulmonary emphysema. These changes in the bronchopulmonary tract probably are permanent because they persisted for eighteen months. The lesions described in this patient are similar to the changes which occur in guinea pigs exposed to sublethal doses of sulfuric acid mist. It is unlikely that chronic changes will often result in humans, for sulfuric acid fumes are so irritating that workers cannot remain in such an atmosphere. —*Pulmonary effects of sulfuric acid, A. Goldman, & W. T. Hill, A. M. A. Arch. Indust. Hyg. & Occup. Med., September, 1953, 8: 205.*—(*T. H. Noehren*)

Pulmonary Tension Disorders in Children.—The primary causes of pulmonary tension rarefactions in the lungs of infants and children are (*1*) congenital bronchial malformation and (*2*) acquired interstitial and pleural air cysts. Differentiation of the acquired from the congenital forms is important for prognosis and treatment and is best accomplished by carefully correlating the roentgenographic and clinical findings. Serial chest roentgenograms are the most important single aid in differential diagnosis; bronchography and planigraphy occasionally are diagnostic. In the congenital group, complete surgical removal is the only definitive treatment for all but the generalized forms; the acquired lesions are best treated conservatively. Although differentiation may be impossible, it is facilitated by considering these lesions in anatomic groupings according to their extent and gross roentgenologic appearance. The following groupings are useful for this purpose: (*1*) clear cystic rarefactions, which include loculated congenital cysts, tension pneumothorax, solitary bullae or blebs, post infectious pneumatoceles, and sequestration of the lung; (*2*) unilateral diffuse rarefactions, including cystic hamartomas and obstructive emphysema; and (*3*) bilateral diffuse rarefactions, which include cystic bronchiectasis, honeycombed lung, and asthmatic or croupous emphysema.—*Roentgen*

differentiation of pulmonary tension disorders in infants and children, J. A. Campbell & R. A. Silver, Radiology, August, 1953, 61: 161.—(W. J. Steininger)

Bronchial Changes in Silicosis.—In 50 cases of silicosis, 8 of which were complicated by tuberculosis, bronchographic studies with water-soluble contrast material revealed important bronchial changes, even when there were no symptoms. Irregular contours of the bronchial walls with changes in caliber, bronchospasm, and bronchoparalysis were noted in 44 cases; important clinical signs of bronchitis were present in only 20. The changes were more extensive in the advanced stages of silicosis. Bronchiectasis was present in 14 patients, 8 of whom had clinical evidence of the disease. Bronchostenosis and obstruction were observed in 4 cases of moderately advanced silicosis, in 15 cases of advanced silicosis, and in 6 cases of silico-tuberculosis. In 5 cases, segmental atelectasis was noted, but areas of opacity may be the sum of shadows cast by atelectasis and by massive fibrosis. Kinking and shifting of bronchi were observed in 17 cases. Extensive emphysema was revealed in bronchograms by defective alveolar filling, giving the appearance of a tree deprived of foliage. In a normal bronchogram the water-soluble contrast material was reabsorbed in twenty to forty-five minutes; in cases of silicosis with extensive bronchial changes, the absorption was considerably delayed. The bronchial changes revealed by bronchography in the absence of clinical signs of bronchitis may account for the frequent changes in the blood count and the erythrocyte sedimentation rate of silicotic patients. If correlated with other clinical and laboratory investigations, bronchography is a valuable means of exploring the bronchial tree in silicosis.—*Über Bronchialveränderungen bei der Silikose und Siliko-Tuberkulose, G. Worth & W. Heinz, Fortschr. a. d. Geb. d. Röntgenstrahl., March, 1953, 78: 263.—(L. Molnar)*

Osteo-arthropathy from SBE.—A patient with subacute bacterial endocarditis developed acute hypertrophic osteo-arthropathy as a complicating lesion.—*Osteo-arthropathy from S. B. E., M. C. McCord, Ann. Int. Med., September, 1953, 39: 640.—(T. H. Noehren)*

Brain Abscess from Pulmonary Angioma.—Two patients who had brain abscess associated with pulmonary arteriovenous malformations were treated successfully for their cerebral disease. Two other such cases have been reported previously. The first patient was a 26-year-old man who had convulsive seizures followed rapidly by right-sided paralysis. Lip angiomas, a cardiac murmur, normal cardiac size, and sterile blood cultures were associated with normal studies of the peripheral circulation. Roentgenograms of the chest supplemented by tomography and angiocardiography demonstrated a single, peripheral, lobulated, arteriovenous aneurysm of the right lung with large efferent and afferent channels. The second patient was a 43-year-old engineer with cyanosis and digital clubbing from birth. He had convulsive seizures, headache, and a speech defect during a five-month period. Skin angiomas, slight cardiac enlargement, polycythemia, and sterile blood cultures were associated with multiple angiomatous malformations of the lung, one in the anterior segment and another in the lingular segment of the left upper lobe. Cerebral abscess probably is associated with such a nonseptic pulmonary lesion when the arteriovenous shunt permits bacteria to bypass the pulmonary capillary filter. Brain abscess is acute and lethal, demanding immediate consideration; resection of the pulmonary lesion probably should follow successful treatment of the cerebral infection. The occurrence of a brain abscess when there is no obvious right-to-left shunt in the cardiopulmonary circuit and no other recognizable origin of the abscess should prompt a careful roentgenologic search for a pulmonary angioma.—*Brain abscess associated with pulmonary angiomatous malformation, W. E. Stern & H. C. Naffziger, Ann. Surg., October, 1953, 138: 521.—(M. J. Small)*

Congenital Tricuspid Atresia.—Cardiac anomalies associated with congenital tricuspid atresia may be divided into two groups for clinical purposes: those associated with the fundamental purposes, those associated with the fundamental valvular lesion (atrial septal defect and hypoplasia of the right ventricle); and those involving the outflow tract of the left ventricle, of which pulmonic stenosis is the most important. Review of the roentgenologic examinations in 8 cases suggests: (*1*) that the fundamental lesion is rarely detectable on conventional roentgenograms alone but may be diagnosed on the basis of a consistent angiocardiographic appearance which indicates sequential opacification of the right auricle, left auricle, and left ventricle; (*2*) that pulmonic stenosis may be diagnosed by careful evaluation of the plain films for reduction in the caliber of the intrapulmonary branches of the pulmonary arteries and/or evidence of bronchial collateral circulation (Authors' summary).—*Roentgenologic considerations in the diagnosis of congenital tricuspid atresia, S. N. Marder, W. B. Seaman, & W. G. Scott, Radiology, August, 1953, 61: 174.*—(*W. J. Steininger*)

Hepatic Herniation.—The syndrome of an anomalous lobe of the liver projecting through the adjacent hemidiaphragm into the pleural cavity has been recognized since the eighteenth century but this asymptomatic entity has been established clinically only since the advent of routine chest roentgenography. In the roentgenogram it looks like a neoplasm or cyst, and thoracotomy has been the usual means of identifying the mass as normal liver tissue in so unexpected a position. Despite its rarity, there are definite criteria for its clinical diagnosis. It usually is a smooth, rounded, homogeneous density situated centrally and supradiaphragmatically, moving intimately and synchronously with the diaphragm, and not deformed by respiratory movements. A diagnostic pneumothorax often will separate the lung from the mass; the air may dissect between the anomalous liver lobe and the overlying muscle fibers of the diaphragm. Such a mass must be differentiated from primary neoplasms of the lung, pleura, diaphragm, or liver, as well as metastatic tumor in these organs and tissues, cysts of the lung or liver of either congenital or infectious origin, and loculated pleural effusions. In a recent case a post-traumatic diaphragmatic herniation of a segment of the liver into the right pleural cavity largely met the criteria for the syndrome of an anomalous lobe of the liver. Localized muscular attenuation of the right hemidiaphragm at the site of the herniation as well as dense and old adhesions of the right lower lobe of the lung at this site were strong evidence for regarding an old abdominal trauma as the etiologic agent.—*Herniation of the liver, M. Shoshkes & F. J. Lovelock, Am. J. Roentgenol., October, 1953, 70: 572.*—(*T. H. Noehren*)

Thoracic Kidney.—Congenital thoracic renal ectopia occurs in the region of the trigonum lumbocostale of Bochdalek. A broad-based thoracic mass adjacent to the posteromedial portion of the diaphragm should arouse suspicion of high renal ectopia. With proper urographic studies it should not be difficult to differentiate a thoracic kidney from pulmonary tumors or hernias of other abdominal viscera. A case of this anomaly was correctly diagnosed by proper roentgenographic techniques.—*Thoracic renal ectopia, H. S. Weens & M. H. Johnston, Am. J. Roentgenol., November, 1953, 70: 793.*—(*T. H. Noehren*)

Mediastinal Hematoma.—Two cases of traumatic mediastinal hematoma were caused by steering-wheel injuries suffered in automobile accidents. In one case, the hematoma presented laterally in the postero-anterior view and was thought at first to be Hodgkin's disease. The second case had kyphosis with a barrel chest, and in this instance the hematoma was best seen in the lateral view, centered over a fracture of the sternum. Pain on respiration was the main subjective finding, associated with tenderness in the patient who

had the fractured sternum. One important physical sign was distended neck veins, signifying some venous obstruction. In such cases, dyspnea and signs of shock are to be expected if hemorrhage becomes extensive enough to rupture into the pleural space and compress the lung. Tumors can present identical findings roentgenographically except that the history of trauma is lacking and the shadow will not disappear on bed rest. Mediastinal effusion theoretically might give a similar roentgen appearance, but none has been seen in any of the cases of this type in the literature.—*Traumatic mediastinal hematoma, Z. F. Endress, Am. J. Roentgenol., October, 1953, 70: 576.*—(*T. H. Noehren*)

Mediastinal Cysts.—Most bronchogenic cysts produce no symptoms and are discovered by routine examinations in both infants and adults. Such an uncomplicated intrathoracic anomaly is readily revealed by roentgenograms, but diagnostic signs are rare unless an air-fluid level is demonstrable. When this is present, it favors the diagnosis of bronchogenic origin. The shape may tend to change from spherical in the recumbent position to "teardrop" in the erect position. This is difficult to demonstrate, the extent of the change depending upon the firmness of the cyst wall, its fixation by neighboring structures, or its immobility due to adhesions. Small cysts not seen in the conventional roentgenogram may show in laminagrams of the mediastinum. Distortion and displacement of the barium-filled esophagus depends upon the size of the cyst. When doubt exists as to the nature of the lesions, esophagoscopy may exclude endoesophageal lesions, and bronchoscopy may exclude endobronchial lesions. Aspiration may be justified if a mediastinal cyst cannot be differentiated from loculated pleural effusion. The fluid from a bronchogenic cyst varies from thin, clear, and watery to thick, creamy material resembling pus; the cellular content, however, will clearly differentiate it from pus. If the fluid is acid and contains peptic enzymes, it comes from a gastrogenic cyst, which usually is significant in the first year of life. These cysts occur chiefly in the posterior-inferior mediastinum and, as they increase and encroach on the pleural space, most of them lie to the right of the spine. The aorta probably bars extension into the left hemithorax. Symptoms such as cough, dyspnea, or dysphagia depend upon the size and location of either a bronchogenic or gastrogenic cyst. In infants, cyanosis may be transient, occurring only during feeding, crying, or straining. As the cyst enlarges, atelectasis may produce permanent cyanosis. Displacement of the heart or pressure on the cardiac nerves may cause palpitations. Hemoptysis is usually due to complications such as a fistula between the cyst and air passages in gastrogenic cysts; peptic ulceration with perforation or communication with the esophagus may produce hematemesis or melena. The nature of an uncomplicated cyst can be determined only by histopathologic study of its wall or examination of its contents. In adults, the differentiation of cysts from malignant or potentially malignant tumors is so difficult that excision is both desirable and advisable. In infants and children, symptomatic gastric cysts are usually rapidly lethal unless removed. The exact diagnosis is really unnecessary since almost all cysts of the mediastinum may give rise to lethal complications and should be removed unless there is a serious contraindication.—*Bronchogenic cysts, R. F. Miller, M. Graub, & E. T. Pashuck, Am. J Roentgenol., November, 1953, 70: 771.*—(*T. H. Noehren*)

Supraclavicular Shadows.—Tumors or other disease processes which result in obliteration of the supraclavicular fossae can be detected roentgenographically by the absence of one or both supraclavicular shadows. This sign enables the radiologist to detect lesions not otherwise roentgenographically evident, as shown in a series of 12 cases. It is also of value in determining the extent of the disease and the effectiveness of radiation therapy. Probably the greatest value of the supracalvicular shadows is in chest survey examinations. Three conditions, obesity, gross malposition-

ing, and extremely sloping shoulders, all of which are recognizable, have been observed to obliterate one or both shadows.—*The supraclavicular shadows in chest film interpretation, H. I. Amory & P. E. Sieber, Radiology, July, 1953, 61: 8.*—(*W. J. Steininger*).

Solitary Lung Masses.—In 156 cases, roentgenograms demonstrated a mass which appeared to be situated in the lung. This was the only roentgenologic evidence of significant pulmonary disease which was unassociated with the picture of bronchial obstruction and which showed no evidence of cavitation. In 55 (35 per cent) the lesions were malignant, including bronchial adenomas. Of the malignant lesions 17 were metastatic. The most common lesion in the entire group was granuloma in 65 cases. No causative agent could be cultured or identified microscopically in 42; *Mycobacterium tuberculosis* was cultured in 7 cases. Among the characteristics which might be useful in arriving at a proper diagnosis, size alone was not indicative of the nature of the mass. The lesions varied in shape from perfectly spherical to those markedly lobulated; bronchogenic carcinoma tended to be less regular than any other lesion, but this feature could not be relied upon as a diagnostic sign. The borders of the various lesions ranged from very sharp and well-demarcated to poorly defined, but sharpness of the border could not be relied upon to distinguish the benign from the malignant lesions. The shadows of the 156 lesions ranged from faint to dense and homogeneous. There was no characteristic feature which could be used to distinguish the benign from the malignant lesions, except that roentgenologic evidence of calcification was never found among the malignant lesions. Calcification, either as punctate deposits or lamination was found in 32 cases, and frank roentgenologic evidence of calcification in a solitary mass in the lung is almost certain proof of its benign nature. Some method of body section roentgenography should be employed in all attempts to demonstrate the calcification since calcium deposits were demonstrated by means of laminagraphy in several masses which showed no evidence of calcification in the ordinary stereoscopic roentgenograms of the thorax. Evidence of growth was obtained in 19 cases in this series. Of the 22 malignant masses found by earlier examination, 13 had grown, while only 6 of the 23 benign lesions known to have been present for some time had enlarged.—*Solitary mass in the lung, C. A. Good, R. T. Hood, Jr., & R. McDonald, Jr., Am. J. Roentgenol., October, 1953, 70: 543.*—(*T. H. Noehren*)

Bronchogenic Carcinoma.—Studies of 532 consecutive, confirmed cases of cancer of the lung seen from April 1, 1946, to January 1, 1953, included microscopic examination of tissue in 484 cases. In the remaining 48 cases the diagnosis was substantiated by finding cancer cells in the bronchial secretions. The proportion of squamous-cell carcinoma, undifferentiated carcinoma, and adenocarcinoma in this series corresponds to that generally recorded. Only 19 of the 532 patients were seen before the onset of symptoms. Rarely was no abnormality noted in the chest roentgenogram. A bronchoscopic biopsy of the carcinoma was obtained in only one-fourth of the 380 patients who were operated upon, indicating that 24 per cent of these bronchogenic carcinomas presented in the main bronchus, the upper portion of the lower lobe bronchus, or projected into the main bronchus from the upper lobe orifice. In almost one-third of the patients who were operated upon, a histologic diagnosis was not obtained preoperatively. The lack of a histologic diagnosis should not delay operative exploration of a patient in whom the clinical symptoms and roentgenologic findings suggest bronchogenic carcinoma. Aspiration needle biopsy was employed only when the lesion was regarded as hopelessly inoperable. Radical extirpation of the cancer was always attempted when there was no evidence of spread beyond the limits of the operative field. In all, 380 patients (71 per cent) were explored; in 205 patients (39 per cent of the entire group), the cancer was extirpated. Car-

cinomatous involvement of the recurrent laryngeal nerve with ipsilateral vocal cord paralysis consistently indicated a nonresectable cancer in this series, as opposed to others. The operative mortality among patients in whom the cancer was extirpated was 22 per cent. The five-year survival rate was 22 per cent of the patients with the cancer removed and 9 per cent of the entire series. Three patients whose lesion was not extirpated have survived longer than two years following the diagnosis. All 3 were diagnosed by the cytologic examination of the bronchial secretions alone. Exploratory thoracotomy of one of the 3 patients yielded tissue which did not reveal cancer, and this patient has survived longer than four years. The other 2 patients refused operation; one has survived four years, the other three years. None of these 3 patients now appears to have cancer of the lung. This and other reported series indicate that the proportion of patients leaving the hospital alive with the cancer removed is directly related to the proportion of the patients in whom extirpation is attempted.—*Cancer of the lung: An analysis of 532 consecutive cases, J. H. Gibbon, F. F. Allbritten, J. Y. Templeton, III, & T. F. Nealon, Jr., Ann. Surg., October, 1953, 138: 489.*—(*M. J. Small*)

Radiation for Esophageal Cancer.—In 2 cases of carcinoma of the esophagus the autopsy failed to reveal residual tumor seventeen and thirty-four months after combined external and intracavitary radiation therapy. Another patient survived twenty-five months without evidence of recurrence, clinically, roentgenologically, by esophagoscopy and biopsy. This patient died of heart disease, and no thorough autopsy was obtained.—*Therapy in esophageal carcinoma, D. C. Adler & P. H. Deeb, Am. J. Roentgenol., November, 1953, 70: 709.*—(*T. H. Noehren*)

Pulmonary Physiology and Surgical Decisions.—Surgical techniques have so improved that little pulmonary reserve is needed to sustain life throughout a thoracic operation and the postoperative period. Thus, a conventional 7-rib thoracoplasty in small stages has been performed over a nonfunctioning lung in a severely emphysematous 47-year-old man whose preoperative maximum breathing capacity was 38 liters, whose residual capacity was 50 per cent of the total volume, and whose arterial blood revealed carbon dioxide retention and mild hypoxia at rest. The anesthesiologist can maintain oxygenation and prevent dangerous carbon dioxide accumulation except in patients with diffuse obstructive emphysema. In these, the anesthetist can force air into the lungs, but he usually has no means to assist expiration so that carbon dioxide retention is virtually certain. Judicious haste should keep the anesthesia as brief as possible; intermittent hyperventilation with manually assisted expiration might be useful. Severe paradoxical chest wall motion is a serious problem during the postoperative period. Prevention is much more effective than treatment. Resection of ribs anteriorly should be done cautiously because this area has no other support and because the first, second, and third ribs support almost the entire anterior chest wall. Better still, procedures which maintain a strong chest wall, such as extraperiosteal plombage, might be chosen. Among 21 patients who had 4 to 6 ribs resected, no more than 2 of the ribs were resected anteriorly; 8 showed no change and the mean reduction in function of the remainder was 17 per cent, with extremes from 4 to 33 per cent. In 9 of this series, a 7- or 8-rib thoracoplasty was done and all had decreased function postoperatively, the mean being 20 per cent and the extremes 11 to 44 per cent. The homolateral lung still functions so well after a 6-rib thoracoplasty because (*1*) most of the motion of the thoracic parietes comes from the uninvolved diaphragm and lower chest wall; (*2*) damaged lung chiefly collapses; (*3*) healthy lung under the collapsed area is displaced downward, is still distended, is perfused with blood, and can be ventilated by lower thoracic and diaphragmatic motion; and (*4*) there is a reduced vital capacity post thoracoplasty, but the maximum breathing

capacity is little influenced since the breathing rate is accelerated. If a markedly contracted wedge segment or lobe is removed without complications, there is often no discoverable change in the cardiorespiratory function. There are no data comparing definitively the physiologic alterations after thoracoplasty with those after resection. There are, of course, circumstances in which resection spares far more healthy lung tissue than thoracoplasty. When a lung is totally destroyed, there usually is some overdistention of the remaining lung with scoliosis, and pneumonectomy usually causes less further loss of function than does a total thoracoplasty. From the standpoint of pulmonary function alone, thoracoplasty is not indicated after resection except possibly following pneumonectomy. Plombage is a more physiologic way to prevent the displacement of the mediastinum. Thoracoplasty should be preferred until it can be shown that plombage is tolerated for years. It is doubtful whether prolonged overdistention will cause true obstructive emphysema. There has been no significant difference between two groups of tuberculous patients after one had thoracoplasty with lobectomy and the other lobectomy alone. In two conditions, surgery may increase respiratory reserves: (*1*) when the lung is encapsulated in an inelastic peel, or (*2*) when large cysts so displace and compress the lung that respiration is impaired. Mere pleural symphysis causes no measurable alteration of function, but a relatively unyielding envelope which impedes motion always reduces function. In general, the duration of the lung's collapse does not affect the success of decortication. Both parietal and visceral peels should be removed, including those over the diaphragmatic surface and costophrenic sinus. In normal persons, peak physical exertion is not limited by the "air pump" but by the cardiovascular system. Thus, an untrained normal man can augment his oxygen uptake to a level eight to ten times that used in the resting state. For short periods the volume of respired air can be increased fifteen to twentyfold. Cardiac output, however, can be increased only four- or fivefold.—*Decisions in thoracic surgery as influenced by the knowledge of pulmonary physiology, W. Woodruff, C. G. Merkel, & G. W. Wright, J. Thoracic Surg., August, 1953, 26: 156.*—(*R. E. MacQuigg.*)

Respiratory Insufficiency in Poliomyelitis.—Biochemical data were collected on patients with acute poliomyelitis to demonstrate, as early as possible in the disease, oxygen lack or carbon dioxide retention resulting from respiratory insufficiency. Of the 35 patients with acute poliomyelitis, some never had evidence of respiratory muscle paralysis, some had paralysis when first seen, and some later developed respiratory insufficiency. Blood pH, total plasma carbon dioxide content, carbon dioxide tension of the plasma (pCO_2), and arterial hemoglobin oxygen saturation were determined. Most of the patients in all three groups had respiratory alkalosis early in their disease. If respiratory muscle paralysis developed, respiratory alkalosis continued long after clinical signs of dyspnea appeared. The clinical picture usually associated with the need for artificial respiration in poliomyelitis is that of decreased respiratory reserve or increased effort, usually not accompanied by actual respiratory failure until the clinical picture of dyspnea is well established. If he has a normal airway and has no intrapulmonary disease, the poliomyelitis patient usually indicates his need for a respirator well before anoxia or carbon dioxide retention occurs. Laboratory tests give valuable aid and later guide the care of respiratory patients but they cannot replace careful clinical observations in deciding when a mechanical respirator should first be used.—*Studies in respiratory insufficiency: I. Carbon dioxide and oxygen studies in early respiratory paralysis in poliomyelitis, D. G. Dickinson, J. L. Wilson, & B. D. Graham, Am. J. Dis. Child., September, 1953, 86: 265.*—(*M. J. Small*)

Exsufflation Therapy.—Exsufflation, a procedure imitating the physiologic effects of coughing, was used successfully in a case of

poliomyelitis with pneumonitis due to aspiration of vomitus. In this procedure, inflation of the lungs is accomplished, during a two-second period, by a negative pressure of 40 mm. of mercury, produced by a vacuum-cleaner motor in a conventional tank respirator. Then, the tank's butterfly-valve, 5 inches in diameter, opens to the atmosphere and three-quarters of the negative pressure is dissipated in 0.03 to 0.04 second. This abrupt pressure rise causes a swift recoil of the lungs from their initial inspiratory expansion to the expiratory position; the alevolar air is rapidly expelled. During the maximal dilatation of the bronchi in the inspiratory phase, air flows past any obstructing plugs of mucus to the alveoli. In the expiratory phase, when the bronchi are narrowed, the increased pressure of the air trapped behind the plugs tends to expel them toward the mouth. As the air pressure rises within the tank, the patient is propelled toward the head end of the respirator and then suddenly stopped by the collar baffle, throwing secretions toward the head and the viscera against the diaphragm. In the case reported, clinical and roentgenographic changes indicated clearing of the lung lesion after twenty-four hours of exsufflation. A 9.1 per cent rise in oxygen saturation, from 87.4 to 96.5 per cent, occurred during the first half hour of exsufflation. The elimination of bronchial secretions in this case by exsufflation was similar to that in 48 other patients in whom mucus or mucopurulent exudate had produced obstruction of the tracheobronchial tree.—*Aspiration pneumonitis complicating poliomyelitis: A case successfully treated by exsufflation, H. E. Seanor, G. J. Beck & A. Ainley, Ann. Int. Med., July, 1953, 39: 140.*—(*T. H. Noehren*)

Mechanically Produced Expiratory Flow Rates.—Expiratory flow rates surpassing those recorded in maximal human coughing have been produced by exsufflation with negative pressure. In this procedure the lungs are gradually inflated, by increasing the pressure from a blower through a mask or mouthpiece; at the peak inspiratory pressure of 20 to 40 mm. of mercury, a valve suddenly connects the upper respiratory passageway to the negative side of a vacuum blower and the pressure drops below that of the atmosphere in 0.02 second. Expiratory volume flow rates of 10,000 cc. per second have been produced by this method in normal persons and patients with respiratory difficulties. The average expiratory flow rate initiated by the portable apparatus employed was 15 per cent higher than that produced by a cough of maximal effort in 15 normal persons and approximately double that of 20 patients with bronchial asthma, pulmonary emphysema, bronchiectasis, or poliomyelitis. In the latter clinical entities, the use of exsufflation with negative pressure was generally of therapeutic value when retention of bronchial secretions caused pulmonary atelectasis or impaired respiratory function.—*Mechanical production of expiratory flow rates surpassing the capacity of human coughing, A. L. Barach, G. J. Beck, & W. Smith, Am. J. M. Sc., September, 1953, 226: 241.*—(*W. J. Steininger*)

Physiopathology of Cough.—In contrast to the accepted view that cough is an accelerated expiration, bronchographic studies seem to prove it to be a dynamic phenomenon of the bronchial mucous membrane. The act of coughing is preceded by stretching and then by peristaltic waves, begun in the smallest bronchi and rapidly propagated to the vocal cords. This view is supported by the following bronchographic observations: the esophagus and the pulmonary vessels do not participate in the act; cough may be produced in one lung or even in one lobe; constriction of the bronchi of first and second order is observed at the beginning of the act, while the larger bronchi and the trachea show an undulating movement; prolapse and invagination of the bronchial mucous membrane may also be observed; and, finally, in the accelerated inspiration preceding cough the lobe follows the expansion of the chest, but during the explosive phase it performs a vertical movement which is not parallel to the expansion. This latter phenomenon demonstrates that

cough is not due to an elastic rebound into the initial position. The respiratory muscles may help in coughing but their action is not indispensable. This mechanism shows a certain analogy with that of vomiting, which is accompanied by an increased abdominal pressure, although the act of vomiting itself is produced by antiperistaltic waves. In bronchiectasis and other pathological conditions involving the bronchial wall, the cough is ineffectual and there is no evacuation of secretion or, if the pathological changes are not too advanced, there is partial evacuation. The increased pressure in the bronchial tree during cough has no serious consequences in the normal lung, but its effects may be serious in such conditions as emphysema, pulmonary blebs, bronchiectasis, and cavitation.—*Physiopathologie des Hustens, S. Di Rienzi, Fortschr. a. d. Geb. d. Röntgenstrahl., January, 1953, 78: 1.*—(*L. Molnar*)

Circulatory Dynamics in Emphysema.—Hemodynamic studies were made in 18 patients with pulmonary emphysema at rest. (*1*) The degree of pulmonary hypertension varied directly with the severity of the emphysema, hypercapnia, and anoxia. (*2*) "Pulmonary capillary" pressure was normal in all cases. (*3*) The pulmonary artery-"pulmonary capillary" pressure gradient exceeded normal in 11 patients and correlated significantly with pulmonary artery pressure and with the severity of hypercapnia. (*4*) Total pulmonary resistance exceeded normal in all instances of pulmonary hypertension but correlated well only with the degree of carbon dioxide retention. (*5*) Cardiac output and index were variable. Cardiac index correlated negatively with the total pulmonary resistance. (*6*) The oxygen saturation of arterial blood varied inversely with mean pulmonary artery pressure but did not parallel the other determinants. The oxygen tension of arterial blood did not vary predictably with any of the determinants. (*7*) The carbon dioxide tension of arterial blood correlated closely with mean pulmonary artery pressure, total pulmonary resistance, and pulmonary arteriolar resistance but not with the "pulmonary capillary" pressure. (*8*) The ratio of residual volume to total capacity (RV/TC) varied directly with mean pulmonary artery pressure and total pulmonary resistance. Among the mechanisms in the pathogenesis of pulmonary hypertension, the role of anoxia is confirmed and carbon dioxide is probably important in elevating pulmonary artery pressure and in increasing pulmonary vascular resistance (Authors' summary).—*Studies of pulmonary hypertension: Pulmonary circulatory dynamics in patients with pulmonary emphysema at rest, P. N. G. Yu, F. W. Lovejoy, H. A. Joos, R. E. Nye, & W. S. McCann., J. Clin. Investigation, February, 1953, 32: 130.*—(*E. Dunner*)

Cerebral Circulation in Emphysema.—(*1*) Cerebral blood flow, oxygen consumption, and vascular resistance were measured in 22 patients with chronic pulmonary disease of moderate functional severity and were compared with a group of normal controls of the same average age. The effects of mild exercise were studied in 12 of the patients. (*2*) There was no significant difference in cerebral blood flow as measured by the intermittent sampling technique in 13 of these subjects as compared with the continuous sampling technique in the remaining 9 subjects. (*3*) Mean values for cerebral blood flow, cerebral arteriovenous oxygen difference, cerebral oxygen consumption, and cerebral vascular resistance did not differ significantly from the normal control subjects. (*4*) The correlation between cerebral blood flow and arterial pCO_2 was good, whereas no correlation was found between cerebral blood flow and arterial pO_2 or proportional arterial oxygen saturation. (*5*) The effects of exercise on cerebral metabolic functions in these patients were variable and without a significant trend. A reduction in arterial pH during exercise did not influence cerebral blood flow. (*6*) These studies demonstrate that cerebral vascular and metabolic functions in chronic pulmonary disease are unrelated to the severity of the clinical and spirometric disturbance but are, rather, re-

lated to alteration in gaseous exchange in the lungs and, specifically, to carbon dioxide retention. (7) Since none of the subjects developed signs of mental confusion during the relatively mild exertion employed, one of the purposes of the study, which was to investigate the physiological basis for the confusion which occurs during physical exertion in many such patients, was not achieved.—*Cerebral circulation and metabolism in pulmonary emphysema and fibrosis with observations on the effects of mild exercise, P. Scheinberg, I. Blackburn, M. Saslaw, M. Rich, & G. Baum, J. Clin. Investigation, August, 1953, 32: 720.*—(*E. Dunner*)

Pulmonary Physiology and Altitude.—Since many people in the United States live at an altitude of 5,000 to 8,000 feet, the normal results for tests employed in evaluating pulmonary function should be established in healthy acclimatized persons living at an altitude of one mile. No evidence was found that this altitude alters the maximum breathing capacity. Resting minute ventilation, however, would be affected by a reduced barometric pressure since this measurement is directly related to the supply and metabolic demands for oxygen. The average resting minute ventilation was 1.8 liters greater in this series than that observed at sea level. There is an increase of 40 per cent in the exercise minute ventilation, most of which is attributable to the lower barometric pressure. The mean value of oxygen consumption was 1.17 liters per minute per square meter of body surface. The increase in ventilation lowers carbon dioxide content and tension in the peripheral arterial blood below values obtained at sea level.—*The pulmonary physiology of normal individuals living at an altitude of one mile, L. L. Anderson, M. L. Willcox, J. Silliman, & S. G. Blount, Jr., J. Clin. Investigation, June, 1953, 32: 490.*—(*E. Dunner*)

Roentgenology of Rarer Pneumoconiosis.—The roentgenologic findings of corundum smelter's lung resemble to a certain extent those encountered in aluminum lung. There are linear densities and enlarged hilar shadows and, in the later stages, conglomerate patchy shadows and widespread bullous emphysema. Roentgenologically, soot lung is manifested by a fine network of pulmonary markings due to perivascular and peribronchial deposits of soot. It may be difficult to differentiate this condition from processes showing a similar anatomic distribution, such as Boeck's sarcoid and cystic lung; this is particularly true when the cystic structure is fine and the cysts are uniform and small. Pulmonary lymphogranulomatosis may give similar pictures so that the differential diagnosis may be difficult when the patient has no clear occupational history and few or no symptoms. The fine nodular densities observed in ochre lung and iron ore lung may be confused with hemosiderosis or with sarcoidosis in its earlier stages, but the extensive peripheral fibrosis in the more advanced stages distinguishes these pneumoconioses from the latter conditions.—*Über die Lungenstruktur in Röntgenbild seltener Pneumokoniosen, R. Haubrich & B. Schuler, Fortschr. a. d. Geb. d. Röntgenstrahl., March, 1953, 78: 272.*—(*L. Molnar*)

Delayed Bronchographic Films.—In 100 consecutive bronchographic examinations on 75 patients, delayed films were obtained thirty to sixty minutes after the initial films. During the interval, coughing and other normal activity were permitted. In 36 of the 100 examinations, delayed films were of definite value. Bronchiectasis was established by the delayed films in 10 cases, although the original study had failed to demonstrate it. In 13 cases, bronchiectasis suggested on the initial films was excluded and, in another 13 cases, bronchi were demonstrated although they had not filled originally. Delayed films were of greatest value in exploring the middle lobe, the lower lobes, and the lingula; they were of little value in the upper lobes, where the Lipiodol usually left the bronchial tree and entered the alveoli. Delayed films should be obtained whenever the bronchi to the lower or middle lobes are inadequately demonstrated. They are of no value when

all of the arborizations of the bronchial tree have been clearly delineated. In such instances, slightly better visualization may be obtained, but the information provided does not justify the additional films. When bronchiectasis is demonstrated on the delayed films, it is because: (*1*) gravity causes the opaque oil to descend to the dependent portions of the lungs, where it mixes with the secretions in the bronchiectatic sacs and at length outlines them; (*2*) during coughing, the ectatic portion of a bronchus cannot participate in the peristaltic expulsive wave. Contraction of the bronchial wall immediately proximal to the bronchiectatic segment may compress the opaque material and force it both proximally to the larger branches and distally to the fixed dilated portion of the bronchus which it then outlines. Demonstration of normal branches not visualized on the original films is due chiefly to the gravitation of Lipiodol to the dependent portions of the bronchial tree. Relaxation of the truncular sphincter, previously in spasm, may explain the filling of normal branch bronchi in some instances, especially in asthmatic patients or those with chronic bronchitis.—*The use of delayed films in bronchography, H. L. Abrams, G. Hencky, & H. S. Kaplan, Radiology, September, 1953, 61: 317.*—(*W. J. Steininger*)

Lateral Views of Segmental Bronchi.—Lateral bronchograms are now one of the accepted means of identifying segmental bronchi. Until recently little attention has been paid to the identification of subsegmental rami, the units which most frequently shift their position on the bronchial tree. These parts shift so commonly that virtually every pair of lungs is characterized by numerous deviations from the so-called normal. The position of the chief pulmonary vessels in lateral projections of the lungs is even less familiar. Lateral views of a pair of lungs perfectly injected, and therefore inflated, with Vinylite, offer a close approximation to the living structures. Lateral views, supplemented by sketches of mediastinal and diaphragmatic surfaces, allow all parts of a single specimen to be illustrated. In each of these lungs there are three major bronchial variations, and vascular anomalies are still more numerous.—*Lateral views of the segmental bronchi and related pulmonary vessels in an injected preparation of the lungs, E. A. Boyden, Radiology, August, 1953, 61: 183.*—(*W. J. Steininger*)

Angiocardiography in Kyphoscoliosis.—Angiocardiographic examination of 4 patients with severe kyphoscoliosis revealed bizarre cardiovascular configurations which varied from case to case. As a rule, the cardiovascular structures accommodated to the deformity of the thorax. The cardiac chambers and great vessels were tipped and rotated but not apparently compressed. The apex of the heart was tipped upward and the base depressed; in an extreme case, the heart lay almost horizontally. Kyphoscoliosis with a convexity to the right caused the heart to rotate so that it resembled the position usually seen in the right anterior oblique position. No kinking or twisting of the main stem pulmonary artery could be identified; the right and left pulmonary arteries and their branches were distorted and conformed to the misshapen lungs. The aorta always closely followed the deformed spine. The superior vena cava took the most direct route from the subclavian vein to the right atrium. Angiocardiography is of limited value in the identification of cor pulmonale. In many cases, right ventricular enlargement or pulmonary artery dilatation may not be evident, although cardiac catheterization shows that the right ventricular and pulmonary artery pressures are elevated. Estimation of right ventricular size by angiocardiography is unreliable unless the exposure is synchronized with the phase of the cardiac cycle.—*Kyphoscoliosis: Angiocardiographic findings, W. Dubilier, I. Steinberg, & C. T. Dotter, Radiology, July, 1953, 61: 56.*—(*W. J. Steininger*)

Calcification of the Left Auricle.—In 2 cases of calcification of the left auricle, the clinical and roentgenographic impression was rheumatic heart disease. Both patients were living at the time of this report. One patient

has at no time shown evidence of auricular fibrillation. Marked involvement of the left auricle with long-standing cardiac disease (rheumatic heart disease) appears to be a prerequisite to ultimate calcification (Authors' summary).—*Calcification of the left auricle, S. D. Hemley, A. Schwinger, & L. A. Harrington, Radiology, July, 1953, 61: 49.—(W. J. Steininger)*

ANTIMICROBIAL THERAPY

Isoniazid Used Alone.—All suitable tuberculosis patients admitted for the five months beginning in March, 1952, to one division of a tuberculosis hospital were treated with isoniazid alone. A "suitable" patient was one who was ill with active and potentially reversible exudative, caseating, or cavernous lesions. More than 60 patients received at least three months of 3 to 4 mg. of isoniazid per kg. daily after a control period. Only bed rest was used as an auxiliary therapeutic measure. In some cases, the disease failed to improve or progressed so that streptomycin and *p*-aminosalicylic acid (PAS) were substituted for isoniazid. Of the 61 cases, the chest roentgenograms showed progression of the disease in 6 and no change in 12, a total of 18. Slight improvement occurred in 18, moderate improvement in 11, and maximal improvement in 14, a total of 43. The response to isoniazid varied even in patients whose lesions seemed similar. Results of this treatment are apparently less certain and less predictable than results obtained with streptomycin and PAS. There was also an apparent "dissociation" of therapeutic effects upon different lesions in the same patient, in the same organ or in different organs. In one patient, the lung lesions cleared partially, but infected lymph nodes did not improve. In another, lesions of the upper lobe cleared and remained healed, while new lesions appeared in the lower lobe. In a third case, severe tuberculous laryngitis and cavitary pulmonary disease were present. Streptomycin-resistant organisms were cultured from the sputum. With isoniazid, the laryngeal lesions healed promptly, but fever continued and fresh pulmonary cavitations appeared. Isoniazid is an effective antituberculous drug and for tuberculous meningitis is probably superior to streptomycin. For caseocavernous pulmonary and extrapulmonary tuberculosis, it is less effective than streptomycin. The therapeutic response of basal pulmonary tuberculosis to isoniazid is less dependable and more variable than to streptomycin and PAS. At present, theoretic considerations strongly support the simultaneous use of streptomycin, PAS, and isoniazid.—*Clinical evaluation of isoniazid, S. S. Cutler, B. Burbank, & B. Battaglia, Ann. Int. Med., September, 1953, 39: 444.—(T. H. Noehren)*

Isoniazid in Children.—Four children two and one-half to nearly ten years old were treated with isoniazid for pulmonary tuberculosis as outpatients in a dispensary for a period of approximately four months. The dosage totaled 4.6 to 11.5 gm., and tolerance to the drug was perfect. In all patients the general condition improved, but roentgenographic improvement was not striking even in the milder cases. Tuberculin allergy was not influenced. Cough and expectoration did not change in the most serious case. Weight increased during the first ten weeks, but in only one patient after the fifteenth week. As a result of this experience, isoniazid will be used only in the first few weeks in such cases and replaced by combined therapy afterwards. The first impression is that isoniazid may not be as beneficial as streptomycin and *p*-aminosalicylic acid.—*Quatro meses de tratamento pela isoniazida em quatro crianças, na "Favela da Praia do Pinto," Laura Pôrto Moitinho filha, Rev. brasil. tuberc., May–June, 1953, 21: 467.—(A. A. Moll)*

Intracavitary Isoniazid with Aspiration.—In 9 cases of pulmonary tuberculosis, isoniazid (one 100 mg. tablet dissolved in distilled water daily) was injected directly into existing cavities. Monaldi's endocavitary aspiration was also used, either simultaneously or before institution of the drug therapy. The most striking effects were the rapid disappearance

of the purulent discharge, development of bleeding tendency in the cavities, and occasional decrease in size of cavities. All patients showed increase in weight, with conversion of sputum and cavity contents. Slight temporary temperature rises occurred shortly after the beginning of isoniazid therapy.—*Primeiros resultados do emprego da isoniazida intra-cavitaria em associação à aspiração de Monaldi, A. Rizzo & R. Costa Carvalho, Rev. brasil. tuberc., May–June, 1953, 21: 441.*—(*A. A. Moll*)

Injection of Tuberculous Cavities.—In spite of some disadvantages, intracavitary injection of streptomycin or isoniazid may yield satisfactory results in tuberculous lesions. The main problem is to locate the cavity. In the upper lobes, planigraphy suffices; in other sites, lateral views should be taken also. Injections were tried in 16 patients, 3 of whom still remain under treatment. In 2 of these, the cavities have closed. In 13, the procedure had to be discontinued because of intolerance to streptomycin, occurrence of pneumothorax, severe hemoptysis, or failure to improve. A stricter selection of cases would undoubtedly have improved the outcome. Injections may be tried without misgivings as, in the event of failure, they do not prevent or hamper use of other methods.—*O tratamento direto da caverna pulmonar tuberculosa: Nota sôbre as injeções intracavitárias de tuberculostáticos, J. Feldman, Clín. tisiol., September–October, 1953, 8: 639.*—(*A. A. Moll*)

Isoniazid for Tuberculosis with Leprosy.—Isoniazid was tried in 20 lepers who had developed tuberculosis. Clinical, roentgenographic, and bacteriologic improvement was noted in 17. Sputum was converted in 8, weight increased in 18, appetite improved in 14, and the temperature became normal in 7 and decreased in 8 others. Isoniazid also acted favorably on the concurrent leprosy. While not displacing recognized surgical collapse measures, this seems to be the most efficient drug for the treatment of tuberculosis in leprosy cases. The total highest dosage of isoniazid in this series was 16.285 gm., at the rate of 5 mg. daily per kg. of body weight.—*Hidrazidoterapia da tuberculose pulmonar em doentes de Hansen, S. de Oliveira Lima, Clín. tisiol., September–October, 1953, 8: 673.*—(*A. A. Moll*)

Treatment of Pulmonary Tuberculosis in Lepers.—Intramuscular streptomycin, 0.5 gm. daily, was valuable for the treatment of pulmonary tuberculosis in lepers. Its action against mucous complications and near specificity for the tuberculoid type of leprosy make its use almost mandatory in such cases. Emergence of streptomycin resistance does not bar continuation of therapy so long as symptoms improve. Recent trials of isoniazid have yielded favorable results in regard to both the tuberculous component and the underlying leprosy. Among 119 patients with pulmonary tuberculosis and leprosy treated with streptomycin, 44 (37 per cent) recovered, and deaths totaled 30 (25 per cent). Among 67 cavitary cases, only 2 recovered, as compared with 42 (80 per cent) recoveries among 52 noncavitary cases. The advantages of early diagnosis are revealed by the outcome in minimal and moderately advanced disease. The death rate, which reached 30.5 per cent among 56 patients with cavities, was only 6 per cent among 5 non-cavitary cases. Among 36 cavitary patients treated medically, only 2 (6 per cent) recovered, while 14 (39 per cent) died. Among cavitary patients who received collapse therapy, only 2 recovered, but only 3 (15 per cent) died.—*Tratamento da tuberculose pulmonar em doente de Hansen, S. de Oliveira Lima & M. Fontes Magarão, Rev. brasil. tuberc., May–June, 1953, 21: 397.*—(*A. A. Moll*)

Streptomycin for Pulmonary Tuberculosis.—From 1947 to 1950, 160 patients with pulmonary tuberculosis were treated with streptomycin. Among 107 cavitary cases, results were good in 31 per cent, fair in 45 per cent, inapparent in 18 per cent, and poor in 5 per cent. Corresponding figures in 53

noncavitary cases were 86.5 per cent; 7.5 per cent; 4 per cent, and 2 per cent. Among 35 patients with cavities measuring more than 4 cm. in diameter, results were good in 9 per cent, fair in 35 per cent, inapparent in 40 per cent, and poor in 14 per cent. Of 22 patients whose treatment was discontinued because of tinnitus, mental disturbances, coma, headache, or eczema, 15 were able to resume the therapy. The dosage usually was 1 gm. daily in 4 injections. The total dosage was between 50 and 150 gm., the amount being individualized. Among 54 far advanced cases, results were good in 20 per cent, fair in 37 per cent, inapparent in 33 per cent, and poor in 9 per cent. Corresponding percentages for 106 moderately advanced cases were 64, 30, 4, and 2. The outcome was far better among 55 early cases, beginning probably less than six months earlier, than among 105 with a longer course. Results seemed more striking when the drug was used only for a short period. Patients suffering relapses invariably responded favorably when streptomycin was used a second time.—*A estreptomicina na tuberculose pulmonar, M. Pires, Clín. tisiol., July–August, 1953, 8: 511.*—(*A. A. Moll*)

Miliary and Meningeal Tuberculosis.—Of 100 patients with miliary and meningeal tuberculosis treated with streptomycin alone during the thirteen months subsequent to April, 1946, in 47 Veterans Administration hospitals, the percentages living and well five years later are as follows: miliary tuberculosis, 47 per cent alive and 37 per cent well; miliary tuberculosis followed by tuberculous meningitis, none alive; miliary tuberculosis and tuberculous meningitis combined, 4 per cent alive and well; tuberculous meningitis, 12 per cent alive and 7 per cent well. All deaths due to the original disease occurred in the first two and one-half years after the termination of treatment. This final measurement of survival in the first large group of miliary and meningeal tuberculosis patients treated with streptomycin alone must be compared with the hopeless pre-streptomycin era and serves as a reference point to demonstrate each increment of survival produced by new chemotherapeutic agents and the combination of various agents.—*Five-year follow-up of 100 cases of miliary and meningeal tuberculosis treated with streptomycin, K. M. Smith, Am. J. M. Sc., June, 1953, 225: 657.*—(*W. J. Steininger*)

Current Therapy of Tuberculous Meningitis.—Since the introduction of isoniazid, the therapy of tuberculous meningitis has entered a new phase. The combination of streptomycin and isoniazid has produced favorable results in a shorter period than heretofore. In the Zurich Childrens' Hospital, dihydrostreptomycin is no longer used because it may damage the auditory branch of the eighth nerve. Although 90 per cent of the children treated with streptomycin show vestibular damage, they compensate more readily for this disturbance than for deafness. Intrathecal chemotherapy is still advocated. In severe cases of meningitis, paraaminosalicylic acid is added to streptomycin and isoniazid. The duration of chemotherapy differs from case to case and is closely related to the clinical improvement and the return to normal of the cerebrospinal fluid findings. Intermittent chemotherapy may be introduced when the fluid becomes normal, but oral isoniazid and parental streptomycin should be continued for several months thereafter. The preliminary results in 18 cases of tuberculous meningitis have been encouraging; there were only 3 deaths. One infant was treated with oral and intrathecal isoniazid alone; the initial transitory improvement was followed by a rapid relapse during treatment, and the infant died. A second infant showed no response to a combination of the three drugs. The third patient was moribund when brought to the hospital. With current chemotherapy, improvement is faster, intrathecal therapy may be given for a shorter period, cisternal injections are no longer necessary, relapses are fewer, and side reactions are lessened. Larger doses of the chemotherapeutic agents are used for older children and adults.—*Der heutige Stand der Therapie*

der Meningitis tuberculosa, E. Rossi, Schweiz. med. Wchnschr., November 21, 1953, 83: 1140.—(E. Dunner).

Glycuronolactone of Isoniazid.—The glycuronolactone of isoniazid synthesized by Passadoult possesses chemical and biologic characteristics not shared by isoniazid and may be an improvement over the latter. Acute toxicity was studied in mice after oral or intraperitoneal administration; the LD_{50} was 1.5 gm. per kg. by the intraperitoneal route and 1.25 gm. by the oral route. Under the same conditions, the LD_{50} of isoniazid was 200 to 250 mg. per kg. by the peritoneal route and 300 mg. per kg. by the oral route. Thus, the acute toxicity of the glycuronolactone is approximately one-fifth that of isoniazid. This decreased toxicity cannot be explained by the lower content of isoniazid since this constitutes half of the molecular weight of the glycuronolactone compound. The combination with glycuronolactone may detoxify the isoniazid molecule. Chronic toxicity was studied by observing the effect of prolonged administration on the growth curve of young rats. Growth was not affected by the glycuronolactone in doses as large as 80 mg. per 100 gm. daily, which is four times the toxic dose of isoniazid. The drug also proved innocuous for dogs in doses of 30 mg. per kg. intravenously. Following intravenous administration, there was rapid diffusion of the glycuronolactone compound throughout the body and rapid elimination in the urine. The bacteriostatic activity of the compound was studied on Youmans' medium with *M. tuberculosis*, strain H37Rv, bovine strains, and strains from patients with active pulmonary tuberculosis. On the whole, the tuberculostatic activity of its glycuronolactone and of isoniazid were comparable. In *in vivo* experiments on 79 guinea pigs and 12 rabbits, equal doses of the glycuronolactone and of isoniazid were at least equally effective. Clinical trials with the new drug were performed, starting in September, 1952, on 36 patients with pulmonary tuberculosis. The total dosage was 1,200 to 1,600 mg. daily in four divided doses by mouth. The drug was tolerated perfectly, and the neurotoxic disturbances seen with larger doses of isoniazid were exceptional. In spite of prolonged administration, no reaction occurred. Of 36 patients treated, 25 had recent forms of pulmonary tuberculosis; 11 had old disease of several years' duration. Among the recent cases, 6 patients had nodular infiltrations and 19 had cavitary-nodular lesions. In the latter group, results were good or excellent in 17; cavities disappeared in 7 patients and decreased markedly in 10 patients. In 13 of the 19 patients, the sputum was converted and has remained negative for *M. tuberculosis*. There were 2 failures, with persistent cavitation. Good results with conversion of sputum were obtained in 5 of the 6 patients with nodular infiltrations after two to three months of treatment. The 11 patients with long-standing disease had already been treated with antibiotics and some had collapse therapy; 8 patients with extensive cavitary lesions showed no benefit from treatment with the glycuronolactone. Of 3 other patients with old lesions of limited extent, there were roentgenographic improvement and sputum conversion in 2. The clinical response to this drug in all patients who responded favorably was comparable to that of isoniazid.—*Étude expérimentale et clinique de l'isonicotylhydrazone de la glycuronolactone, G. Brouet, B. N. Halpern, I. Marche, Mme. I. Mallet, & I. Chrétien, Rev. de la tuberc., 1953, 17: 789.—(V. Leites)*

Bacterial Sensitivity to Isoniazid.—The *in vitro* effect of isoniazid on 322 strains of *M. tuberculosis* from sputum and cerebrospinal fluid was studied; 206 of these strains were from patients receiving isoniazid treatment. Sensitivity to isoniazid was always tested on Youmans' liquid medium, the inoculation being performed with equivalent quantities of bacilli from fifteen- to twenty-day-old cultures on Dubos medium. Concentrations of isoniazid ranging from 0.05 to 20γ per ml. were used. Under these experimental conditions, the growth of H37Rv

was inhibited by approximately 0.05γ of isoniazid per ml. All 84 strains isolated from patients who had never received isoniazid and 27 strains from the cerebrospinal fluid of untreated meningitis patients were completely sensitive to isoniazid, 0.1γ per ml. preventing growth and 0.05γ per ml. inhibiting most of the strains. Some of these strains were highly resistant to streptomycin. The majority of nonpathogenic mycobacteria were insensitive to concentrations of less than 20γ per ml. All bacilli resistant to isoniazid in concentrations of more than 1γ per ml. originated from isoniazid-treated patients. The staining properties of isoniazid-resistant bacilli showed no special characteristics. The colony morphology, acid- and alcohol-fastness, and the affinity for neutral red were not modified. No isoniazid-dependent strains were found. The *in vitro* growth of strains with little or no sensitivity to either drug was never stimulated by a mixture of isoniazid and streptomycin and the effect achieved corresponded to the most active antibiotic. In only 3 instances was the mixture of isoniazid and streptomycin slightly more effective than the most active antibiotic employed separately. The combination of *p*-aminosalicylic acid and isoniazid had a very limited effect *in vitro* on strains with little or no sensitivity to isoniazid.—*Sensibilité et résistance de Mycobacterium tuberculosis var. hominis à l'isoniazide: Étude de 322 souches isolées chez des tuberculeux; action in vitro des associations d'antibiotiques, J. Viallier, H. Serre, & R.-M. Cayré, Ann. Inst. Pasteur, April, 1953, 84: 804.*—(*V. Leites*)

Para-Aminosalycilic Acid Hydrazide in Vitro.—*p*-Aminosalicylic acid hydrazide is a new chemotherapeutic agent, bacteriostatic against human *M. tuberculosis* H37Rv in Sauton medium in a concentration of 0.75γ per ml.; a concentration of 2γ per ml. inhibits the growth completely. In cultures of the bovine strain Vallée, bacteriostasis is produced with a concentration of 0.75 to 1γ and complete inhibition of growth with a concentration of 3γ. The bacteriostatic concentrations of *p*-aminosalycilic acid hydrazide are similar to those of streptomycin and *p*-aminosalicylic acid but considerably lower than those of amithiozone. The bacteriostatic effect persists for approximately forty days, after which time the colonies start to develop again.—*Azione in "vitro" di un nuovo chemioterapico antitubercolare, l'idrazide dell' acido para-aminosalicilico, R. Inzerillo, E. Chiti, Arch. E. Maragliano, March–April, 1953, 2: 391.*—(*L. Molnar*)

A New Derivative of Isoniazid.—A new insoluble derivative of isoniazid, 1,1′-methylenebis (2-isonicotinyl hydrazine) had marked antituberculous properties in mice infected with *M. tuberculosis* H37Rv. This substance was absorbed from the intestinal tract as well as from the subcutaneous tissue. The new compound was three to four times less active than isoniazid on the basis of the absolute value obtained for the 50 per cent protective dose, but the ratio LD_{50}/PD_{50} was very favorable (255) due to the low toxicity.—*Antimycobacterial properties of a new derivative of isoniazid, E. Grunberg & R. J. Schnitzer, Proc. Soc. Exper. Biol. & Med., October, 1953, 84: 220.*—(*E. Soto Figueroa*)

Drug-Resistant Tubercle Bacilli.—Several strains of tubercle bacilli were tested for drug susceptibility when recovered from guinea pigs, mice, and rabbits after prolonged treatment with streptomycin, *p*-aminosalicylic acid (PAS), and in some instances with viomycin. In so far as the emergence of drug-resistant populations is concerned, tubercle bacilli in experimental animals behave differently from those in human beings with pulmonary tuberculosis. Most patients with pulmonary tuberculosis and cultures positive for *M. tuberculosis* after four months' treatment with streptomycin alone had strains of tubercle bacilli with a moderate or high degree of resistance to the drug. Among 43 cultures obtained from guinea pigs with acute experimental tuberculosis treated for 35 to 90 days, all but 2 were completely sensitive to streptomycin, and these 2 showed only a slight loss of susceptibility. Of 42 cultures obtained from guinea pigs treated for 135

to 575 days, 3 showed moderate or high resistance, 22 had a slight loss of susceptibility, and 17 were still completely sensitive to streptomycin. All of the 5 cultures of tubercle bacilli from residual chronic abscesses in 3 guinea pigs after 300 days of streptomycin treatment were sensitive to streptomycin. In mice with a subacute infection, no drug-resistant cultures were found after 198 days of streptomycin or PAS therapy. Other groups of mice were infected with three different strains of tubercle bacilli and treated with streptomycin alone or the combination of streptomycin and PAS for 160 days. Viable cultures were obtained from all but one of the 54 treated mice. Only 3 showed a moderate or high degree of streptomycin resistance, and 32 a slight loss of susceptibility. The administration of PAS apparently had no significant effect on the streptomycin resistance. Eighteen positive cultures were obtained from 10 rabbits infected intravenously with virulent bovine tubercle bacilli treated for periods up to sixteen months with streptomycin or the combination of streptomycin and viomycin. Only 9 showed a slight loss of susceptibility or borderline resistance. Only one chronic caseous and cavitary lung lesion in a rabbit yielded resistant tubercle bacilli after eight months of streptomycin treatment; sensitive or only slightly resistant cultures were obtained from 4 others after treatment for as long as one year. There are factors in animals with experimental tuberculosis, as contrasted with the disease in man, which tend to suppress the emergence of a high degree of bacterial resistance during drug treatment. Further investigations of these factors may broaden our understanding of the whole phenomenon of drug resistance.—*Infrequent appearance of drug-resistant strains of tubercle bacilli in experimental animals treated with streptomycin and p-aminosalicylic acid, E. Wolinsky & W. Steenken, Jr., J. Bact., August, 1953, 66: 229.*—(*F. G. Petrik*)

Antagonism Between Antibiotics.—When mice infected with pneumococci are treated with multiple doses of chlortetracycline (Aureomycin), of penicillin, or of a combination of the two, the combination may be either more effective or less effective than penicillin alone. Whether antagonism or addition is observed depends upon the relationship of the doses or, more precisely, upon the therapeutic effectiveness of the antibiotics. In 112 experiments, mice infected with pneumococci were treated with chlortetracycline plus penicillin for two or three days and the results were compared with those obtained with either drug alone. In 50 experiments, the first dose of chlortetracycline was given four hours before the first dose of penicillin; significant antagonism of penicillin by chlortetracycline was observed in 11, and an additive effect in 9, experiments. Both effects were obtained whether the drugs were given on a four-hour or a twenty-four-hour schedule. A single dose of chlortetracycline preceding multiple doses of penicillin produced antagonism in some experiments and addition in others. In 43 experiments, the two drugs were administered concurrently; antagonism was present in 9 and addition occurred in 11. In 19 experiments, penicillin was given before chlortetracycline; there was no antagonism, but addition occurred in 12. Antagonism may sometimes occur if penicillin precedes chlortetracycline by four hours or more but it is definitely more difficult to demonstrate, if it exists at all. Antagonism is most likely to occur when the dose of chlortetracycline is low and poorly effective and when the dose of penicillin is highly effective, although not completely protective. There are ratios between the doses or therapeutic effectiveness of the two drugs at which only antagonism or addition occurs. A single antibiotic can be used as successfully as any combination for most infections, is simpler and less toxic. In some diseases such as brucellosis, tuberculosis, and enterococcic endocarditis, certain combinations are well established; in other infections more study is needed. If combinations are to be tried empirically for fulminating infections, it would seem wise to use two relatively bactericidal drugs from the group which includes penicillin, streptomycin, and bacitracin. For some infections the most

promising combinations may be composed of a bacteriostatic drug such as chlortetracycline, chloramphenicol, or oxytetracycline (Terramycin) with a bactericidal one. When these combinations are tried, the largest practicable doses of each should be employed. —*Comparison of results of treatment of pneumococcic infections in mice with multiple doses of Aureomycin and penicillin combined compared with each drug alone, M. H. Lepper, G. G. Jackson, H. F. Dowling, & J. Seto, Am. J. M. Sc., June, 1953, 225: 648.*—(*W. J. Steininger*)

Penicillin Reactions.—Penicillin leads the medicinal agents today in the frequency, diversity, and severity of the hypersensitivity which it induces. The manifestations of penicillin sensitivity may involve almost any allergic reaction or immunologic mechanism. The most severe is an anaphylactic sensitivity, and its greatest danger is death from anaphylactic shock. Exfoliative dermatitis and severe irreversible vascular reactions, possibly leading to periarteritis nodosa, contribute additional allergic deaths. Persons with a personal or familial history of allergy are more easily sensitized to penicillin and have most of the severe and fatal penicillin hypersensitivities. Much penicillin hypersensitivity would be prevented if penicillin were not given for minor ailments, if it were not applied locally, if depot penicillin were employed only when necessary, if the oral route of administration were used, and if combined parenteral injections with other antigens were avoided. Anaphylaxis usually can be recognized by skin test, especially by the immediate whealing reaction on cutaneous or intracutaneous testing and at times by the delayed (twenty-four to forty-eight hours) intracutaneous reaction. Penicillin reactions may be avoided in large part by careful attention to any allergic history, as well as to previous penicillin therapy, especially penicillin reactions, and by proper precautions in managing such patients. The oral route of penicillin administration should be preferred to parenteral routes. If parenteral administration is necessary, the injection should be into the arm and low enough to allow the use of a tourniquet in case of severe reaction. Penicillin reactions can be treated with tourniquets, sympathomimetic drugs, antihistaminic agents, corticotropin, cortisone, and diet. The physician must be prepared to meet the emergency of anaphylactic shock.—*Penicillin reactions: Their nature, growing importance, recognition, management and prevention, R. A. Kern & N. A. Wimberley, Jr., Am. J. M. Sc., October, 1953, 226: 357.* (*W. J. Steininger*)

Combined Protein and Penicillin Therapy.—Treatment with penicillin interferes with the normal defense mechanism of the patient against infection. During antibiotic therapy the immunity to infection does not develop sufficiently. By the combined injection of penicillin and protein (Omnacillin "Hoechst"), the defense reactions of the patient are improved. This combination was successful in the treatment of chronic pneumonias as well as in other local infections.—*Kombinierte Proteinkörper- und Penicillintherapie bei sich verzögernd lösenden oder chronisch gewordenen Pneumonien und anderen Infektionsprozessen, G. Holler & G. Kollert, Wien. klin. Wchnschr., August 28, 1953, 65: 684.*—(*G. C. Leiner*)

LABORATORY STUDIES

Hypergammaglobulinemia in Tuberculosis.—Serum levels of gamma globulin, muco-proteins, and polysaccharides in 23 patients with far advanced active pulmonary tuberculosis were correlated with changes found in liver and lymph node biopsy specimens and sternal marrow findings. Statistically significant correlations were found between the level of the serum gamma globulin and both the total degree of hepatic alteration and the number of plasma cells in the bone marrow. The level of serum gamma globulin is an index of the severity of the nonspecific host reaction seen in the liver (Authors' summary).—*Hypergammaglobulinemia in pulmonary tuberculosis, F. Schaffner, G. C. Turner, D. E. Eshbough, W. B. Buckingham, & H. Popper, A. M. A. Arch. Int. Med., October, 1953, 92: 490.*—(*G. C. Leiner*)

Local Sensitivity After BCG Vaccination.—In order to demonstrate that BCG vaccination, while causing a general immunity process, also creates an area of specific attraction for reinfection bacilli, guinea pigs were vaccinated with BCG. Thirty-five days later they received an intracardiac injection of virulent tubercle bacilli. Autopsies one and two months later showed that, in the unvaccinated controls, there were caseous lesions in the lungs, liver, and spleen of all the animals; among the BCG-vaccinated guinea pigs no such lesions were present, but half of all the vaccinated animals showed small, caseous lesions at the cite of the BCG vaccination.—*Il tropismo acquisito specifico nelle cavie vaccinate con B.C.G. ed inoculate con bacilli TBC. per via intracardiaca, G. Curci, Arch. tisiol., May, 1953, 8: 378.*—(*A. Mochi*)

Growth Factor for M. Tuberculosis.—On whole blood and on plasma media which had been solidified with 3 per cent New Zealand agar, tubercle bacilli sometimes failed to survive unless an ether-soluble tuberculolipid was added.—*A growth factor for Mycobacterium tuberculosis, J. Marks, J. Path. & Bact., July, 1953, 66: 151.*—(*H. J. Henderson*)

Chemistry of Acid-Fastness.—The reaction between crystal violet and lipids of the mycolic acid type went to completion in chloroform, and a stoichiometric relationship was found to exist between acid and dye. The complex so formed was soluble in xylene and chloroform and exhibited an intense absorption band in the near ultraviolet (3,500 Å). Other acids tested reacted with the dye, but the specific absorption peak was not produced. With blocking of the carboxyl groups or the hydroxyl group of leprosinic acid, the characteristic reaction did not occur.—*Chemistry of acid-fastness, J. W. Berg, Proc. Soc. Exper. Biol. & Med., October, 1953, 84: 196.*—(*E. Soto Figueroa*)

Rapidly Growing, Acid-Fast Bacteria.—A collection of the rapidly growing, acid-fast bacteria was reassembled to prepare reliable, useful descriptions of the species represented. Many tests were used with limited success in the attempt to separate these organisms into recognizable species. Of the 124 strains examined, 62 per cent belonged to two species, *Mycobacterium phlei* Lehmann and Neumann and *Mycobacterium smegmatis* (Trevisan) Lehmann and Neumann. The remaining species can be characterized only after a study of many more strains. The available tests and observations were not adequate to delineate some of the species, and additional, correlating characters for their identification must be sought.—*Rapidly growing, acid-fast bacteria: I. Species descriptions of Mycobacterium phlei Lehmann and Neumann and Mycobacterium smegmatis (Trevisan) Lehmann and Neumann, R. E. Gordon & M. M. Smith, J. Bact., July, 1953, 66: 41.*—(*F. G. Petrik*)

PUBLIC HEALTH AND EPIDEMIOLOGY

Trends in Tuberculosis Mortality.—The trends in tuberculosis mortality in continental United States may be shown by current statistics. There were 25,080 deaths from all forms of tuberculosis in 1952. More than 90 per cent of the deaths were due to respiratory tuberculosis. Of the 2,866 deaths from nonrespiratory tuberculosis, more than one-third were due to tuberculous meningitis and almost one-third to disseminated tuberculosis. Since 1945, the tuberculosis mortality rate has been reduced by 60 per cent. The younger age groups have shown higher percentage declines than the older groups. The characteristic pattern exhibited by tuberculosis mortality has been one of highest mortality in the nonwhite male group, followed in order by the non-white female, white male, and white female groups. Non-white men have a higher mortality rate than nonwhite women at ages over thirty years. At ages under 30, non-white females generally have the higher rates. The pattern for nonwhites is essentially the same as for whites.—*Trends in tuberculosis mortality in continental United States, A. P. Iskrant & E. Rogot, Pub. Health Rep., September, 1953, 68: 911.*—(*E. Dunner*)

Prevention of Tuberculosis.—Even though statisticians believe that 1952 figures will show tuberculosis to be ninth among the causes of mortality in the United States, and although it now accounts for only 2 per cent of deaths in the country as a whole, tuberculosis is still a leading cause of death among young adults. The following are some measures which must be continued: (*1*) Hospital beds must be more wisely utilized for patients with active disease. Some waiting lists for such beds now are so long that the discovery of new cases only adds to the sense of frustration since there are no means of treating them. (*2*) More and better trained personnel are as important as hospital beds. In some sanatoriums whole wings are closed for lack of professional staff. The following points need further exploration: (*1*) Precisely, what types of food deficiency are or may be critical for the patient? (*2*) Are the general assumptions concerning the relationship between "poor living conditions" and tuberculosis valid? (*3*) How does exhausting physical work adversely affect resistance? (*4*) How can the available conflicting evidence regarding exogenous and endogenous infections be explained? (*5*) Even though it is not possible to change entirely an adverse environment, can careful investigation reveal some predominant factor which could be modified? (*6*) Is the tendency of tuberculosis to reactivate related to tension or emotional stress?—*Tuberculosis: A time for decision, T. Parran, Pub. Health Rep., October, 1953, 68: 921.*—(*E. Dunner*)

Small Tuberculosis Epidemic.—A 27-year-old public school teacher returned to his teaching duties following a tour of military service and within ten days was diagnosed as having active pulmonary tuberculosis with cavitation. The children in his class and the family with whom he lived subsequently received periodic chest roentgenograms. It was also determined that none of the schoolchildren's families had active tuberculosis. After seventy-two days, 4 of the schoolchildren showed evidence of a primary tuberculosis infection. In all, 10 children were eventually infected; one of them died from tuberculous meningitis. Of these 10 children, 2 were members of the family with whom the schoolteacher resided. It was apparent that those children who sat nearest the teacher were the first to become ill and had more extensive primary tuberculosis than those who became ill at a later date. This indicates a droplet-type infection due to proximity rather than an air-borne infection due to dust inhalation.—*Begutachtung und Inkubationszeit der Tuberkulose, J. Steiger, Schweiz. med Wchnschr., November 21, 1953, 83: 1135.*—(*E. Dunner*)

Hazards of Air Pollution.—In a Chicago study of the health hazards of urban air pollution, the pneumonia and respiratory tract cancer death rates in the city's cleanest and dirties areas were compared on an occupational basis. Those occupational groups with the greatest exposure to prevailing outdoor pollution exhibit the sharpest rise in death rates for both pneumonia and respiratory tract cancer in the city's dirtiest districts as contrasted to the cleanest areas. "Laborers" have death rates for both diseases 2.5 to 3.5 times higher than the "professional" group in both clean and dirty districts. The laborers' respiratory tract cancer rate is almost twice as high in dirty as in clean districts, and its pneumonia death rate almost three times as high. The physical laborers expend the most energy, consequently breathe the most dirty air, and face the greatest respiratory hazards. Urban air pollution may not be responsible for the increased incidence of lung cancer, but it seems to be one significant factor in this increase. Any factor associated with a doubling of the lung cancer rate is significant, especially when other factors such as housing, nutritional state, and socio-economic status are comparable.—*Occupation as a factor in the community health hazards of air pollution, C. A. Mills, Am. J. M. Sc., August, 1953, 226: 177.*—(*W. J. Steininger*)